

CLAIMS

1. A wearable article worn about the lower torso of a wearer, the wearable article comprising a temperature change element including a permeable layer, an impermeable layer disposed in a face-to-face arrangement with the permeable layer, and a temperature change substance interposed between the permeable layer and the impermeable layer, wherein urine deposited onto the temperature change element can penetrate through the permeable layer in a z direction to the impermeable layer and wherein the impermeable layer prevents urine from passing completely through the temperature change element in the z direction and supports the movement of urine in an x-y plane to wet the temperature change substance.
2. The wearable article as defined in Claim 1 wherein the temperature change substance includes an endothermic salt.
3. The wearable article as defined in Claim 1 wherein the temperature change element is elastically foreshortened.
4. The wearable article as defined in Claim 1 wherein the temperature change element comprises a multiplicity of compartments and the temperature change substance is disposed in each of the compartments.
5. The wearable article as defined in Claim 1 wherein the temperature change element comprises a multiplicity of fluid channels disposed parallel to the multiplicity of compartments.
6. The disposable diaper as defined in Claim 1; wherein the permeable layer faces the body of the wearer.
7. A disposable diaper having a longitudinal axis, a first waist region, a second waist region, and a crotch region interposed therebetween, the disposable diaper comprising:
  - a backsheet;
  - a topsheet joined to the backsheet, the topsheet having a body-facing surface;
  - an absorbent core disposed intermediate the backsheet and the topsheet; and
  - a temperature change element disposed on the topsheet, the temperature change element including a permeable layer, an impermeable layer disposed opposite the permeable

layer, and a temperature change substance interposed therebetween, wherein urine deposited onto the temperature change element can penetrate through the permeable layer in a z direction to the impermeable layer and wherein the impermeable layer prevents urine from passing completely through the temperature change element in the z direction and supports the movement of urine in an x-y plane to wet the temperature change substance.

8. The disposable absorbent article as defined in Claim 7 wherein the temperature change substance includes an endothermic salt.
9. The disposable absorbent article as defined in Claim 7 wherein the temperature change element is elastically foreshortened.
10. The disposable absorbent article as defined in Claim 7 wherein the topsheet is elastically foreshortened and the temperature change element is attached to the topsheet.
11. The disposable absorbent article as defined in Claim 7 wherein the topsheet is permeable and wherein the temperature change element is interposed between the topsheet and the absorbent core such that at least a portion of the topsheet forms the permeable body facing surface of the temperature change element.
12. A disposable diaper having a longitudinal axis, a first waist region, a second waist region, and a crotch region interposed therebetween, the disposable diaper comprising:
  - a backsheet;
  - a permeable topsheet joined to the backsheet, the topsheet having an upper body-facing surface and a lower surface;
  - an absorbent core disposed intermediate the backsheet and the topsheet; and
  - a plurality of temperature change elements disposed on the topsheet parallel to and spaced apart from the longitudinal axis, wherein the temperature change elements comprise permeable layers formed by the topsheet, impermeable layers formed by impermeable members interposed between the topsheet and the absorbent core, and a temperature change substance disposed on the topsheet, wherein urine deposited onto the temperature change elements can penetrate through the topsheet in a z direction to the

impermeable members and wherein the impermeable members prevent urine from passing completely through the temperature change elements in the z direction and support the movement of urine in an x-y plane to wet the temperature change substance.

13. The disposable absorbent article as defined in Claim 12, wherein the temperature change substance is interposed between the topsheet and the impermeable members.
14. The disposable absorbent article as defined in Claim 12 wherein the impermeable members of the temperature change elements are elastically foreshortened.
15. The disposable absorbent article according to Claim 12 wherein the permeable topsheet comprises two Z-folds parallel to the longitudinal axis, and wherein the impermeable members are disposed within the two Z-folds.
16. The disposable absorbent article according to Claim 15, wherein the two Z-folds further comprise two elastic members disposed along outside edges of the two impermeable members.
17. A disposable diaper having a longitudinal axis, a first waist region, a second waist region, and a crotch region interposed therebetween, the disposable diaper comprising:
  - a backsheet;
  - a topsheet joined to the backsheet;
  - an absorbent core disposed intermediate the backsheet and the topsheet; and
  - a temperature change element disposed on the topsheet along the longitudinal axis, the temperature change element includes a permeable layer having a body facing surface, a temperature change substance disposed on the permeable layer, and an impermeable layer partially wrapped around the permeable layer such that longitudinal edges of the impermeable layer stop short of meeting, leaving a center portion of the body facing surface of the permeable layer exposed.
18. The disposable diaper as defined in claim 17, wherein the temperature change substance is disposed on the body-facing surface of the permeable layer in parallel regions covered by the longitudinal edges of the impermeable layer.

19. A disposable diaper having a longitudinal axis, a first waist region, a second waist region, and a crotch region interposed therebetween, the disposable diaper comprising:
  - a backsheet;
  - a topsheet joined to the backsheet;
  - an absorbent core disposed intermediate the backsheet and the topsheet; and
  - impermeable barrier leg cuffs disposed on the topsheet parallel to the longitudinal axis and
  - temperature change elements disposed on the barrier leg cuffs, each of the temperature change elements includes a permeable layer having a body facing surface, an impermeable layer formed by the barrier leg cuff, and a temperature change substance disposed on the permeable layer.
20. The disposable diaper as defined in claim 19, wherein the temperature change substance is disposed between the permeable layer and the barrier leg cuff.